REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-14 are pending, with Claims 1-5 and 7-10 amended, and Claims 13-14 added by the present amendment.

In the Official Action, Claims 1-5 and 7-10 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Kerfoot et al. (U.S. Patent No. 6,704,511, hereinafter "Kerfoot") and Kosaka (U.S. Patent No. 5,986,800); Claims 5 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kerfoot and Kosaka in view of Alphonsus et al. (U.S. Patent No. 5,764,405, hereinafter "Alphonsus"); and Claims 6 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kerfoot and Kosaka in view of Mathis (U.S. Patent No. 4,726,444).

Claims 1-5 and 7-10 are amended to more clearly describe and distinctly claim Applicants' invention. New Claims 13-16 are added to recite an additional feature of Applicants' invention. Support for this amendment is found in Applicants' originally filed specification.[1] No new matter is added.

Applicants acknowledge with appreciation the personal interview between the Examiner and Applicants' representative on June 13, 2007. During the interview, the Examiner appeared to acknowledge that the applied references do not disclose or suggest Applicants' claimed terminal point without reflection. However the Examiner suggested that such a feature might be found within another prior art reference. The Examiner suggested the claims be amended to recite additional features disclosed in Applicants' specification.

[1] Specification, Fig. 7 and page 16, lines 7-8.

Claims 1 and 7 are amended to more clearly describe and distinctly claim Applicants' invention. Support for this amendment is found in Applicants' originally filed specification.[2] No new matter is added.

Briefly recapitulating, Claim 1 is directed to a wavelength division multiplexing and optical transmission apparatus. The apparatus includes

> a plurality of optical transmitting units for modulating a plurality of laser signals having inherent wavelengths with a plurality of data signals and outputting a plurality of modulated optical signals occupying a signal band;
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> optical amplifying means for outputting an amplified spontaneous emission light signal, including an optical amplifier having a signal input terminal terminated without reflection;
>
> band pass filtering means for band pass filtering the output of the optical amplifying means with a first filter circuit including a first plurality of parallel band pass filters connected to a first optical amplifier, and a second filter circuit parallel to the first filter circuit and including a second plurality of parallel band pass filters connected to a second optical amplifier, and outputting a respective first and second non-modulated spectrum slice optical signal, the first non-modulated spectrum slice optical signal being adjacent on a high side to the signal band, the second non-modulated spectrum slice optical signal being adjacent on a low side to the signal band; and
>
> optical multiplexing means for multiplexing the non-modulated spectrum slice optical signals with the plurality of modulated optical signals and transmitting a multiplexed optical signal, wherein
>
> said band pass filtering means includes means for controlling one of the first and second optical amplifier to compensate for a lack of an amplified spontaneous emission light signal at a predetermined wavelength.

Claim 7 is directed to

> A method for transmitting a wavelength division multiplexed optical transmission, comprising:
>
> modulating a plurality of laser signals having inherent wavelengths with a plurality of data signals and outputting a plurality of modulated optical signals; amplifying a spontaneous emission light signal with non-input and outputting an amplified spontaneous emission light signal;

[2] Specification, page 29, lines 11-28.

band pass filtering the amplified spontaneous emission light signal;
outputting a non-modulated spectrum slice optical signal;

multiplexing the non-modulated spectrum slice optical signal as a dummy signal of an optical signal to be added in the future with the modulated optical signals; and transmitting a multiplexed optical signal, wherein

said band pass filtering includes band pass filtering with a first and second plurality of band pass filters connected to a corresponding first and second optical amplifier.

Kerfoot describes a wavelength division multiplex optical signal including a WDM combiner to provide a source signal, at least one transmitter coupled to an input of the WDM combiner, a broadband noise source, and a filter coupled between the broadband noise source and another input of the WDM combiner. In one embodiment, the filter is an optical notch filter. In another embodiment, the filter includes a WDM demultiplexer coupled through plural filters to provide a plurality of noise signals, and a WDM multiplexer coupled through at least one of the plural filters to respective noise signals.

In Kerfoot, head end 130 provides a source signal that combines information signals and filtered noise signals. Information signals come from one or more transmitters 150. At the same time, ***filtered noise signals come from noise source 138*** through filter circuitry 140. The filter blocks optical signals at wavelengths that correspond to the wavelengths of the information signals from the transmitters 150 so noise is not added to the desired information signals. The filter passes optical signals (e.g., noise signals from broadband noise source 138) at wavelengths not within the stop band. By loading unused channels (called idler channels) with noise channels, the information signals on the used channels do not draw all of the power from optically pumped fiber amplifiers in repeaters 110. Instead, the noise signals carried to the idler channels draw their proportionate share of the repeaters power as if they were information signals. In this way, all WDM channels will appear to be fully loaded from their initial operation. As more capacity is needed from network 100, additional transmitters

150 are added and filter circuitry 150 is modified or replaced so as to block optical signals at the wavelengths of the information signals provided by transmitters 150.[3]

However, as acknowledged during the interview of June 13, 2007, Kerfoot does not disclose or suggest Applicants' claimed an optical amplifier having a signal input terminal terminated without reflection. That is, the broadband noise source 138 of Kerfoot is not an optical amplifier having a signal input terminal terminated without reflection. As disclosed in Applicants' specification, each non-input optical amplifier is terminated without reflection *to cut off an input signal.*[4] In Applicants' optical amplifier having a signal input terminal terminated without reflection, amplified spontaneous emission light is emitted from an erbium doped fiber, in which energy of a pumping laser signal source (not shown) is absorbed. Kerfoot makes no mention of optical amplifiers having a signal input terminal terminated without reflection.

Kerfoot also does not disclose or suggest Applicants' claimed controlling an optical amplifier to compensate for a lack of an amplified spontaneous emission light signal at a predetermined wavelength.

Applicants have considered the remaining references and submit these references do not cure the deficiencies of Kerfoot. Because none of the applied references, individually or in combination, disclose or suggest all the elements of independent Claims 1 and 7, Applicants submit the inventions defined by Claims 1 and 7, and all claims depending therefrom, are not rendered obvious by the asserted references for at least the reasons stated above.[5]

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[3] Kerfoot, column 4, lines 16-42.
[4] Specification, page 17, lines 7-9.
[5] MPEP § 2142 "...the prior art reference (or references when combined) must teach or suggest **all** the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)."

Furthermore, with Applicants' claimed invention, the amplified spontaneous emission light signal output from the optical amplifier 32 is divided into a plurality of amplified spontaneous emission light signals.[6] Then, a plurality of dummy signals from the light dividing element 33 are multiplexed in the optical multiplexer 38 with the plurality of amplified spontaneous emission light signals. Thus, when one of the filtered dummy signals is degraded, redundancy (n+l) in one of the optical amplifiers (the first and second amplifiers) is used to emphasize gains of amplified spontaneous emission light signals of wavelengths adjacent to the specific degraded wavelength. Therefore, transmission quality is not adversely influenced by the lack of an amplified spontaneous emission light signal of the specific wavelength.

Applicants submit the failure of Kerfoot to disclose or suggest the above-discussed objective of the claimed invention is a first reason why it would not have been obvious for one ordinary skill in the art to modify Kerfoot with the filters of Kosaka or another reference in the manner suggested by the Official Action.

In addition, as seen in Fig. 7 and described on page 27, line 24 – page 28, line 24 of Applicants' specification, "Because the number of wavelengths of the multiplexed optical signal input to the optical amplifier repeater approaches the designed number of wavelengths, the same gain profile as that of the optical amplifier repeater can be maintained in the optical amplifier repeater, a gain distribution of the modulated optical signals output from the optical transmitting units 3-m to 3+m is flattened in the optical amplifier repeater, and the transmission quality of the modulated optical signals can be improved." This benefit of Applicants' invention is not possible with the device of Kerfoot. Applicants submit the failure of Kerfoot to disclose or suggest any aspects relating to this benefit is another reason why it

[6] Specification, page 26, line 30 to page 27, line 23.

would not have been obvious for one ordinary skill in the art to modify Kerfoot with the filters of Kosaka in the manner suggested by the Official Action.

Finally, Fig. 4 of Kosaka discloses an optical transmission system having an optical power adjusting unit 8 that includes low pass optical filters 20 connected to optical gain adjusters 17. However, Kosaka does not disclose or suggest ***a first filter circuit including a first plurality of parallel band pass filters connected to a first optical amplifier, and a second filter circuit parallel to the first filter circuit and including a second plurality of parallel band pass filters connected to a second optical amplifier*** as recited in New claims 15-16. Furthermore, Kosaka does not disclose or suggest the use of high pass filters as recited in new Claims 13-14.

Accordingly, in view of the present amendment and in light of the previous discussion, Applicants respectfully submit that the present application is in condition for allowance and respectfully request an early and favorable action to that effect.

Respectfully submitted,

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